

TAMARACK BAY CONDOMINIUM ASSOCIATION (PWS 4430046) SOURCE WATER ASSESSMENT OPERATOR FINAL REPORT

June 6, 2001



State of Idaho Department of Environmental Quality

Disclaimer: This publication has been developed as part of an informational service for the source water assessments of public water systems in Idaho and is based on data available at the time and the professional judgement of the staff. Although reasonable efforts have been made to present accurate information, no guarantees, including expressed or implied warranties of any kind, are made with respect to this publication by the State of Idaho or any of its agencies, employees, or agents, who also assume no legal responsibility for the accuracy of presentations, comments, or other information in this publication. The assessment is subject to modification if new data is produced.

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for Tamarack Bay Condominium Association, McCall, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Tamarack Bay Condominium Association drinking water system consists of one ground water well. The well, with a production rate of 120 gpm, has an overall low susceptibility rating for volatile organic contaminants (VOCs) and synthetic organic contaminants (SOCs) and an overall high rating for inorganic contaminant (IOC) and microbials. Even though there are no recorded contaminant sources in the area, there have been water sample detections of the IOC aluminum, a relatively high pH reading of 9 and the presence of coliform bacteria. These detections strongly suggest that well water is being contaminated by a local source downstream of the well (i.e. the delivery system). It is unlikely that contamination could be entering the well somewhere below the sanitary seal due to artesian (55 psi) pressure at the well head.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the Tamarack Bay Condominium Association, source water protection activities should focus on implementation of best management practices aimed at protecting the wellhead and surface seals within the zone immediate to the well. Urban and residential runoff including septic systems should be monitored and dealt with. Disinfection practices should be implemented if microbial contamination recurs. Most of the source water protection designated area is outside the direct jurisdiction of the Tamarack Bay Condominium Association. Partnerships with state and local agencies should be established and are critical to success. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Boise Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR TAMARACK BAY CONDOMINIUM ASSOCIATION, NEW MEADOWS, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

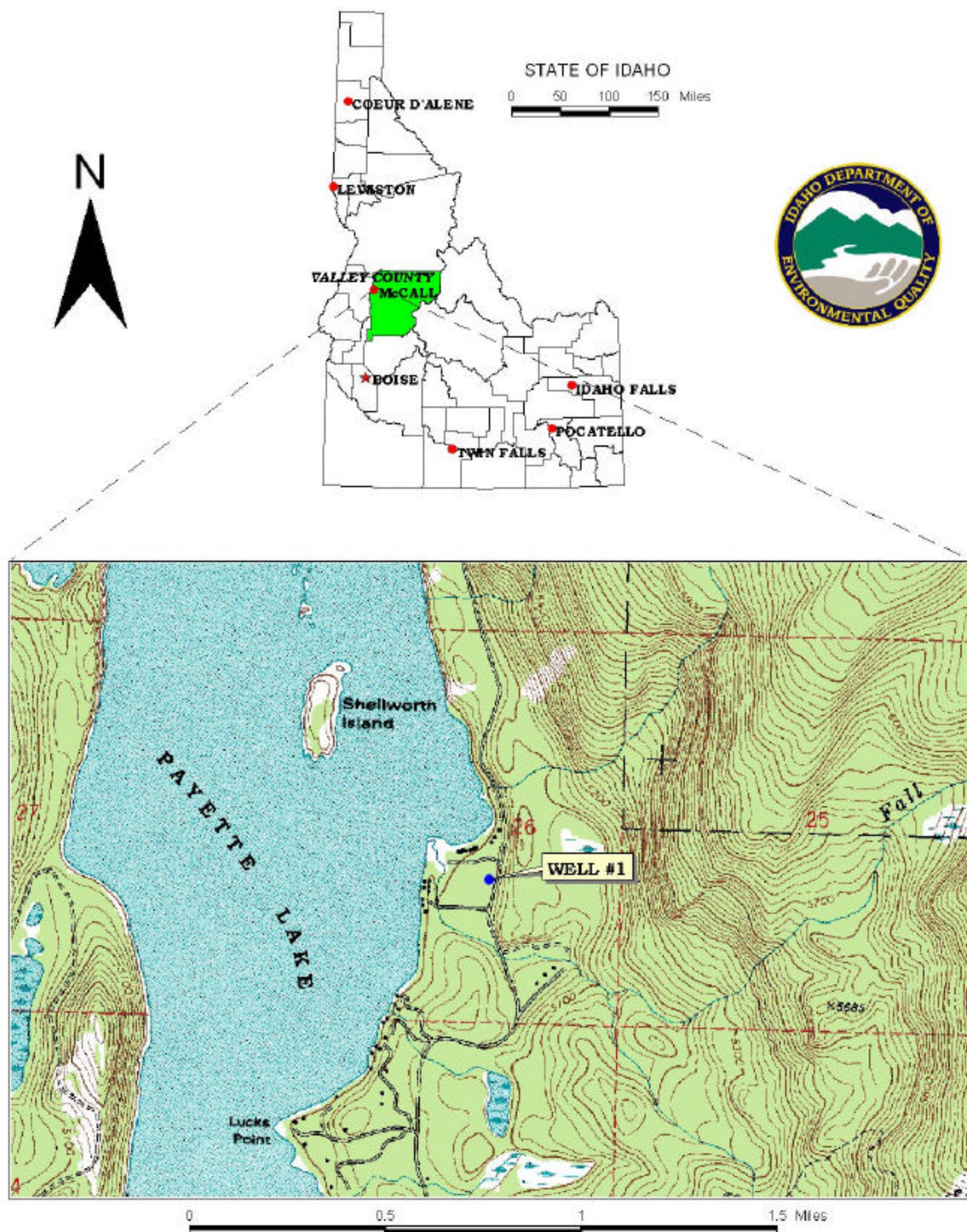
The public drinking water system for the Tamarack Bay Condominium Association is comprised of one well. The community well serves approximately 105 people and is situated north of McCall, within the condominium complex, on the east side of Payette Lake (Figure 1). Even though there are no recorded contaminant sources in the area, there have been water sample detections of the IOC aluminum, a relatively high pH reading of 9 and the presence of coliform bacteria. These detections strongly suggest that drinking water is being contaminated by a local source because there are no known contaminant sources upgradient of the well. With the presence of microbial contamination it is highly likely that contamination is entering the delivery system downstream of the well. There have been no recorded detections of SOC or VOC.

Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer.

The precise zone of contribution for Tamarack Bay Condominium Association's well is difficult to determine without considerable fieldwork. DEQ would normally use a computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for groundwater associated with the Idaho Batholith. However, in this case the well appears to have intercepted a known north/south trending fault that extends along the eastern shore of Payette Lake or some other concealed fracture in the granite. While other wells in the area produce approximately 10 gpm, this well is artesian and produces 120 gpm. One likely hypothesis is that the source water capture zone extends up into the higher topography to the northeast including the small lake perched in the glacial cirque shown in figure 2. The actual data used by DEQ in determining the source water assessment delineation areas are available upon request.

FIGURE 1. Geographic Location of the Tamarack Bay Condominiums



Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

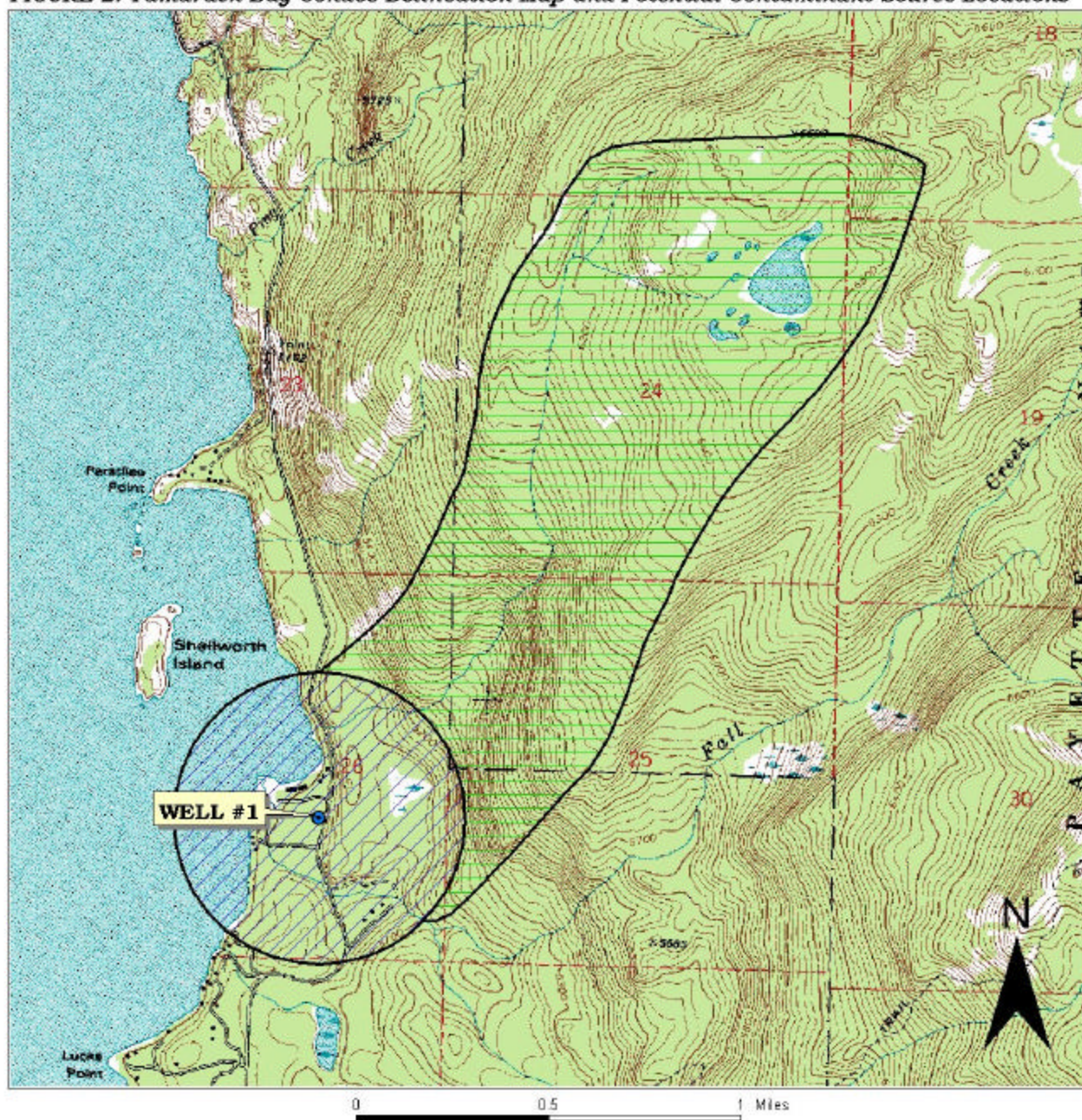
The dominant land use outside the Tamarack Bay Condominium Association area is timbered recreational. Land use within the immediate area of the wellheads consists of the condominium complex with septic tanks and drain fields. Payette Lake is immediately west of the condominium complex.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination. These involve educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in February 2001. The first phase involved identifying and documenting potential contaminant sources within the Tamarack Bay Condominium Association Source Water Assessment Area through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. As reflected in figure 2, no potential contaminant sites were identified during the inventory process.

FIGURE 2. Tamarack Bay Condos Delineation Map and Potential Contaminant Source Locations



PWS# 4430046
WELL #1

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

Hydrologic sensitivity is moderate for Tamarack Bay Condominium Association's well (Table 1). This reflects the nature of the soils being in the moderately to well drained class, the vadose zone (zone from land surface to the water table) being made predominantly of decomposed granite (sand) and the first ground water being located more than 300 feet below ground surface. Additionally, the well does not have laterally extensive low permeability units that could retard downward movement of contaminants.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. The Tamarack Bay Condominium Association drinking water system consists of one well that extracts ground water for residential uses. The well system construction score is moderate risk based on well log information. A sanitary survey of the well was completed in September 1997 to determine if it was in compliance with wellhead and surface seal standards. Information gathered during the sanitary survey indicated that the wellhead and surface seal are in compliance and the wellhead is protected from surface flooding. Well logs indicate that casing and annular seals had been extended into low permeability units and current public water system (PWS) construction standards are being met.

The IDWR Well Construction Standards Rules (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the Recommended Standards for Water Works (1997) during construction. Table 1 of the Recommended Standards for Water Works (1997) lists the required steel casing thickness for various diameter wells. Six-inch diameter casing on wells requires a casing thickness of at least 0.288-inches. The surface seal must be installed into a low permeability unit. The Tamarack Bay Condominium Association well casing is slightly under standard requirements with a casing thickness of 0.250 inch.

Potential Contaminant Sources and Land Use

In terms of land use (see contaminant inventory section in Table 1, Page 9) the well rated low for VOCs (i.e. petroleum products), and SOC's (i.e. pesticides). There are no commercial and agricultural land uses in the delineated source areas and these pollutants have not been found in water samples. On the other hand, the IOC aluminum and microbials have been detected in samples. Although these contaminants are likely being

introduced into the system somewhere along the delivery system downstream of the well; the necessary fieldwork to pinpoint the precise means of contamination has not been conducted. Therefore, the system must automatically be rated at high risk for IOCs, and microbial contamination. DEQ's suspicion that contamination is occurring somewhere downstream of the well is also based on the 683-foot depth to water and the artesian nature of the well. With a wellhead pressure of 55 psi there is little chance that contamination could be descending and entering the well at the production zone.

Final Susceptibility Ranking

A contaminant detection above a drinking water standard MCL or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. In terms of total susceptibility, this well rates low for SOCs and VOCs due to a combined score of 6 for system construction and hydrologic sensitivity, and high risk for IOCs and microbials due to past detections of these contaminants (Table 1 and Attachment A).

Table 1. Summary of Tamarack Bay Condominium Association Susceptibility Evaluation

Table 1: Summary of Tamarack Bay Condominium Association Susceptibility Evaluation										
Well	Susceptibility Scores ¹									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	M	H	L	L	H	M	H	L	L	H

¹H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

The artesian nature of Tamarack Bay Condominium's well, the considerable depth to water and the lack of contaminant sources combine to give the source water and well a low risk for contamination. However, IOC and microbial contamination have entered the system at some point that is likely to be downstream of the well. Efforts should be made to find the source and pathway for this contamination and action should be taken to correct the problem.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For the Tamarack Bay Condominium Association, source water protection activities should focus on implementation of best management practices aimed at protecting the wellhead and surface seal within the zone immediate to the well. Residential runoff should be monitored. Spills and accidents from homeowners within Tamarack Bay Condominium Association should be closely monitored and dealt with. Disinfection practices should be implemented if microbial contamination recurs. Some of the designated source water protection area is outside the direct jurisdiction of the Tamarack Bay Condominium Association. Partnerships with state and local agencies and homeowners should be established and are critical to success. Continued vigilance in keeping the well protected from surface flooding can also keep the potential for contamination reduced. It is imperative that the source of past detections of microbials and aluminum be found and eliminated. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Boise Regional DEQ Office (208) 373-0550

State DEQ Office (208) 373-0502

Website: <http://www2.state.id.us/deq>

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at (208) 743-6142 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY

LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho State Department of Agriculture, 1998. Unpublished Data.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Administration, 1966. Groundwater conditions in Idaho. Water Information Bulletin No. 1.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Idaho Engineering and Geology, Inc. 1996. "Report of Well Re-working and Aquifer Testing Tamarack Well, McCall, Idaho>" Prepared for Tamarack Bay Condominium Association.

Idaho Water Resource Board, 1973. Comprehensive Rural Water and Sewerage Planning Study for Washington County. U.S. Geological Survey (prepared in cooperation with University of Idaho, Washington State University and the cities of Moscow, Idaho and Pullman, Washington), Water Resources Investigations Report 89-4103, 73 p.

Parlman, D.J. 1986. "Quality of Groundwater in the Payette River Basin, Idaho." USGS Water-Resources Investigations Report 86-4013.

Ralston D.R. and G.S. Johnson. 1992. "Groundwater Supply Potential for the Payette Lakes Water and Sewer District." JUB Engineers, Inc.

Schmidt, D. L. and Mackin, J. H. 1970. Quaternary Geology of Long and Bear Valleys, West-Central Idaho." Geologic Survey Bulletin 1311-A.

Whitehead, R.L. and D.J. Parlman, 1979. A Proposed Ground Water Quality Monitoring Network for Idaho. U.S. Geological Survey (prepared in cooperation with Idaho Department of Health and Welfare, Division of Environment), Water Resources Investigations, Open-File Report 79-1477, 67 p.

Attachment A

Tamarack Bay Condominium Association Susceptibility Analysis Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report for Public Water System TAMARACK BAY CONDOMINIUMS, WELL #1, Public Water System Number 4430046

1. System Construction

SCORE

Drill Date	6/24/96	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1997
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		3

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	YES	0
Aquitard present with > 50 feet cumulative thickness	YES	0
Total Hydrologic Score		1

		IOC Score	VOC Score	SOC Score	Microbial Score
3. Potential Contaminant / Land Use - ZONE 1A					
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	NO	NO	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		0	0	0	0

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		0	0	0	0

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		0	0	0	0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0

Cumulative Potential Contaminant / Land Use Score

0 0 0 0

4. Final Susceptibility Source Score	4	4	4	4
5. Final Well Ranking	High	Low	Low	High